Adapted from: Smith, Margaret Schwan, Victoria Bill, and Elizabeth K. Hughes. “Thinking Through a Lesson Protocol: Successfully Implementing High-Level Tasks.”

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| **PART 1: SELECTING AND SETTING UP A MATHEMATICAL TASK (PREPARE)** | |
| What are your **mathematical goals** for the lesson? (i.e., what do you want  students to know and understand about mathematics as a result of this lesson?) | * Students will be able to determine weather an object has an odd or even number of members. * Students will be able to write an equation to express and even number as a sum of two equal addends. |
| * What are your **expectations** for students as they work on and complete this task? * What **resources or tools** will students have to use in their work that will give them entry into, and help them reason through, the task? * How will the students work—   independently, in small groups, or in pairs—to explore this task?   * How will students record and report their work? | Expectations:   * Students will make sense of the problem and preserver in solving it. * Students will create representations to show their reasoning. * Recognize when to use addition and subtraction and which numbers to use. * Show their understanding of addition and subtraction. * Students will work as a team and use mathematical discourse in solving the word problem.   Resources:   * Paper pencil * Manipulatives (unifix cubes, template, base ten block cubes.   Groupings:   * At least 3   Recording and reporting:   * Math journal |
| How will you introduce students to the activity so as to provide access to *all*  students while maintaining the cognitive demands of the task? | **LAUNCH**  Elicit student help to solve your problem  Show a clip of Heber Creeper, or visual of a train.  During Holiday season change problem to the Polar Express.  Use a train whistle for classroom management |

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| **PART 2: SUPPORTING STUDENTS’ EXPLORATION OF THE TASK (EXPLORE)** | |
| As students work independently or in small groups, what **questions** will you ask to—   help a group get started or make progress on the task?   focus students’ thinking on the  key mathematical ideas in the task?   assess students’ understanding of  key mathematical ideas, problem- solving strategies, or the representations?   advance students’ understanding  of the mathematical ideas? | What information do you know from the problem?  What information do you not know?  How are you going to show your reasoning?  Explain your process; how do you know your answer is correct?  Does everyone in the group agree and can everyone explain it? |
| How will you ensure that students remain **engaged** in the task?   What assistance will you give or what questions will you ask a  student (or group) who becomes  quickly frustrated and requests more direction and guidance is  solving the task?   What will you do if a student (or group) finishes the task almost  immediately? How will you  extend the task so as to provide additional challenge? | When the Heber Creeper has 32 wheels, how many stops has it made?  What will the train look like if each train car has 4 wheels? |

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| **PART 3: SHARING AND DISCUSSING THE TASK (DISCUSS/DEBRIEF)** | |
| How will you **orchestrate the class discussion** so that you accomplish your mathematical goals?   Which solution paths do you want to have shared during the  class discussion? In what order will the solutions be presented? Why?   What specific questions will you ask so that students will—  1. make sense of the  mathematical ideas that you want them to learn?  2. expand on, debate, and question the solutions being shared?  3. make connections among the different strategies that are presented?  4. look for patterns?  5. begin to form generalizations?  ***What will you see or hear that lets you know that all students in the class***  ***understand the mathematical ideas that***  ***you intended for them to learn?*** | * Teacher will observe students while working. * Talk about the vocabulary words pairs and even. What is their meaning, use illustrations.   Solution paths:   * Students who demonstrate partial understanding but not all the way to the correct conclusion. * Students who reached the correct solution in different ways * Students with extensions.   Discussion questions:   * Whey did you solve the task this way? * Are there other ways to solve this task? * Does your answer make sense? Can you defend your answer?   How will you know your students have achieved the learning outcome?   * Students’ reasoning’s have led them to an accurate solution. * Students are engaged. |

In Heber, the Heber Creeper makes several stops a day. The train has a head train (an engine), the engine picks up new train cars at each stop. When the train begins it’s day it is one box long (the engine) and has two wheels. At each stop the train gets 3 more train cars and 6 more wheels. What will the Heber Creeper look like after 3 stops? How many wheels will it have and how many train cars will it have?